

these bottoms with bare ground where neither a meadow nor a slough flora can become established. A sudden filling of such a basin will drown standing vegetation and survival may well depend upon buoyant seed floated to a higher shoreline. We have here a logical reason for the development and usefulness of the exserted achene. Other facts corroborate this theory. The time of their production, at the beginning of a wet season, coincides with the most likely time for floods. Examination of the distribution of colonies is often very suggestive of waterlevel, windrow deposits. Tufted stems of old dead colonies may be entirely ignored as likely location points for the present year's colonies, the new being located higher or lower on these shorelines.

The Avicularia have become obligatory land inhabitants and have extended their range to higher and drier locations. That the trend has been away from water rather than toward it is demonstrated by the acquisition of protective characters in xerophytic situations which are readily discarded when the plants again occupy wet locations. One such character is the accrescent perianth which grows with the achene and fully envelopes it when mature. During dry weather this perianth exceeds and clasps the achene, becomes veined and wrinkled, and is more or less carinate. When wet conditions prevail with production of exserted achenes the perianth remains shorter and the sections are spreading and smooth. Reticulations, striations, and other markings on the achenes are probably due to shrinkage of the surface to reduce evaporation. Species of Avicularia on the coastal areas of the Maritime Provinces normally have large smooth exserted achenes surrounded by a spreading perianth. The atmosphere moist from fog, spray, and marshland provides proper conditions for this type of achene.

SUMMARY:- The exserted achene serves usefully in the dispersion of seed during periods of inundation and aids in its survival. It is produced only by species of Avicularia under certain seasonal and weather conditions. Exserted achenes have little or no diagnostic value in differentiating species.

ADDITIONAL NOTES ON THE GENUS PETREA. I

Harold N. Moldenke

Since the publication of my monograph of this group in Fedde's Repertorium Specierum Novarum 43: 1--48 & 161--221 (1938) two hundred and seventy additional specimens have

come to my hands and a considerable amount of new information. The new specimens, cited below, are deposited in the herbaria indicated by the following symbols: Ar = United States National Arboretum, Washington; Ba = Bailey Hortorium, Cornell University, Ithaca; Ca = University of California, Berkeley; Cm = Carnegie Museum, Pittsburgh; Dp = DePauw University, Greencastle, Indiana; Du = Dudley Herbarium, Stanford University; E = Missouri Botanical Garden, St. Louis; F = Chicago Natural History Museum, Chicago; Fl = University of Florida, Gainesville; Fs = Forrest Shreve Herbarium, Tucson, Arizona; Gt = Botanische Anstalten, Göttingen; Ha = Colegio de la Salle, Vedado, Havana; Hp = H. Hapeman Herbarium, Minden, Nebraska; I = Langlois Herbarium, Catholic University of America, Washington; Io = Iowa State College, Ames; It = Cornell University, Ithaca; Ja = Museu Nacional, Rio de Janeiro; Kr = B. A. Krukoff Herbarium, New York Botanical Garden, New York City; La = University of California at Los Angeles, Los Angeles; Lu = Botanisk Museum, University of Lund, Lund; Me = Instituto de Biologia, Universidad Nacional de México, Mexico City; Mi = University of Michigan, Ann Arbor; N = Britton Herbarium, New York Botanical Garden, New York City; Oa = Oakes Ames Economic Herbarium, Botanical Museum of Harvard University, Cambridge; Po = Pomona College, Claremont, California; S = Naturhistoriska Riksmuseet, Stockholm; Sp = Instituto de Botanica, São Paulo; U = Jenman Herbarium, Botanic Gardens, Georgetown, British Guiana; Ur = University of Illinois, Urbana; Vt = University of Vermont, Burlington; W = United States National Herbarium, Smithsonian Institution, Washington; and Z = H. N. Moldenke Herbarium, Watchung, New Jersey.

PETREA Houst.

Synonymy: Petraea B. Juss. apud Hook. f. & Jacks., Ind. Kew. 2: 477, in syn. 1895. -- Petraea Jacq. ex Walp., Repert. 4: 70. 1844; Junell, Symb. Bot. Upsal. 4: 43. 1934. -- Petraea L. apud Benth. in Benth. & Hook. f., Gen. Pl. 2 (2): 1149. 1876. -- Peraea L. ex Nees, Flora 4 (1): 300, sphalm. 1821; Moldenke, Prelim. Alph. List Invalid Names 33, in syn. 1940. -- Petroea L. ex Lam., Encycl. Méth. Bot. Ill. 3: pl. 539, sphalm. 1797; Neumann, Ann. Fl. Pom. 1837--1838: 254--255, sphalm. 1838; Moldenke, Prelim. Alph. List Invalid Names 35, in syn. 1940. -- Petraca Jacq. ex Hoehne, Resem. Hist. Secc. Bot. Inst. Biol. S. Paulo 153, sphalm. 1937; Moldenke, Prelim. Alph. List Invalid Names 33 & 34, in syn. 1940. -- Pehoa L. ex Moldenke in Fedde, Repert. 43: 2, in syn. 1938; Moldenke, Prelim. Alph. List Invalid Names 33, in syn. 1940. -- Petria L. ex Moldenke, Prelim. Alph. List Invalid Names 35, in syn. 1940. -- Pitrea L. ex Moldenke in Fedde, Repert. 43: 2, in syn. 1938.

References: L., Gen. Pl., ed. 1, 347. 1737; Adans., Fam. Pl. 2: 12 & 200. 1763; Necker, Elem. Bot. 1: 362--389. 1790; Lam., Encycl. Méth. Bot. Ill. 3: pl. 539. 1797; Nees, Flora 4 (1): 300. 1821; Ann. Sci. Nat. Paris, sér. 1, 1: 457. 1824; Neumann, Ann. Fl. Pom. 1837--1838: 254--255. 1838; Wittstein, Handwörterb., ed. 2, 675. 1856; Turcz., Bull. Soc. Nat. Imp. Mosc. 35 (2): 328. 1862; Turcz., Bull. Soc. Nat. Imp. Mosc. 36 (2): 212. 1863; Benth. in Benth. & Hook. f., Gen. Pl. 2 (2): 1149. 1876; Ulrich, Internat. Wörterb. Pflanzennamen. 1875; Britten & Boulger, Biogr. Ind. British & Irish Botanists 135. 1893; Hook. f. & Jacks., Ind. Kew. 2: 477. 1895; Gerth van Wijk, Dict. Plant Names 971. 1911; Junell, Symb. Bot. Upsal. 4: 43. 1934; Hoehne, Resenha Hist. Comm. Viges. Anniv. Secc. Bot. 153 & 163. 1937; Standl., Field Mus. Publ. Bot. 18: 1011. 1938; Moldenke in Fedde, Repert. 43: 1--48 & 161--221. 1938; Moldenke, Prelim. Alph. List Invalid Names 33--35. 1940; Moldenke, Suppl. Alph. List Invalid Names 6 & 12. 1941; Moldenke, Known Geogr. Distrib. Verbenac. 17, 20--35, 38, 40--41, 62, 64--65, 73--75, & 97. 1942; Moldenke, Alph. List Invalid Names 34--36. 1942; Niemeyer & Stellfeld, Arquiv. Mus. Parana. 3: 8. 1943; Phytologia 2: 108. 1945; B. P. Reko, Bol. Soc. Bot. Mex. 4: 35. 1946.

Junell in the work cited above gives a detailed discussion of the gynoecium morphology of the genus, based on P. volubilis. As a result of his findings, he removes the genus Timotocia from Briquet's Tribe Petraeae and places it with Ghinia in his "subtribe" Casseliaceae. Necker records the common name "petrée".

In the list of Excluded Species given on page 209 of my monograph the following corrections are to be made: Petraea zanguebarica Gay, Petrea zanguebarica J. Gay, and Petrea zanguebarica J. Gay are all synonyms of Dicerocaryum zanguebarium (Lour.) Merr. of the Pedaliaceae.

PETREA AMAZONICA Moldenke

Le Cointe, in "A Amazonia Brasileira III, Arvores e Plantas Uteis"; p. 470 (1934), under the mis-identification "Petraea volubilis Jacq." lists the common name "viuvinha" for this species.

Additional citations: BRAZIL: Amazonas: Krukoff 4930 (N--photo of isotype, S--photo of isotype, Z--photo of isotype).

PETREA ARBOREA H.B.K.

Synonymy: Petraea arborea H.B.K. apud Pittier, Suppl. Plant. Usual. Venez. 55. 1939. -- Petrea Vincentiana Turcz. ex Moldenke, Prelim. Alph. List Invalid Names 35, in syn. 1942. -- Petraea arborea H.B.K., in herb. -- Petrea arborea H.B.K., in herb.

References: Urb., Symb. Ant. 3: 47--48. 1902; R. O. Williams, Guide Royal Bot. Gard. Trinidad 6 & 11. 1927; Freeman & Williams, Useful Pl. Trinidad 126. 1928; Stapf, Ind. Lond. 5: 39. 1931; Martyn, Ind. Phan. Jenman Herb. 464, mss. 1937; Phelps, Bull. Garden Club Amer., ser. 6, 2: 11. 1937; Pittier, Supl. Plant. Usual. Venez. 55. 1939.

Freeman and Williams in the reference cited above state that the species may be propagated by seed or by layering. They report that the corollas are violet in color, the sepals being of a lighter shade than the corolla, and that the sepals change to a dully ashy-gray after the corollas have dropped. Pittier in the reference cited above reports the common name "tostadito" from Venezuela, Delgado records the same name, and Williams reports "tosatido". Broadway describes the species as a "small tree or shrub" in Trinidad. The name "bejuco de Caballo" recorded by Phelps in the reference cited above does not properly apply to this species, but to F. volubilis.

The Haught 4046 specimen cited below is anomalous and may prove not to be this species. It is described as a shrub 2 m. tall, the leaves very harsh to touch, and the inflorescence showy and purple. It was collected on dry hillsides at an altitude of 600 m. The leaf-texture is more like that of P. rugosa than that of P. arborea. The label is inscribed "Dept. Caldas", but E. P. Killip asserts that it was actually collected in Magdalena.

Additional citations: TRINIDAD: W. E. Broadway 5271 (F, N--photo, S--photo, Z--photo), 7568 (F, La), s.n. [May 22, 1911] (Du--120566, F). COLOMBIA: Magdalena: Haught 4046 (N). VENEZUELA: Aragua: Delgado 135 (F); E. G. Holt 323 (Cm), 327 (Cm); Ll. Williams 10035 (F, F). Carabobo: Saer d'Heguert 831 (N). Federal District: Delgado 101 (F, N); Pittier 13573 (E); Ll. Williams 10061 (F). CULTIVATED: Trinidad: Bailey & Bailey s.n. [March 9, 1921] (N--photo, Z--photo).

PETREA ARBOREA var. BROADWAYI Moldenke

Additional citations: CULTIVATED: Trinidad: W. E. Broadway s.n. [1908] (N--photo of type, Z--photo of type).

PETREA ASPERA Turcz.

References: Pittier, Supl. Plant. Usual. Venez. 55 [as "Petreaea aspera"]. 1939; Moldenke, Known Geogr. Distrib. Verbenac. 24, 31--33, 38, 73, & 97. 1942; Phytologia 2: 108. 1945.

The Seemann 594 cited by me on page 203 of my monograph as from "Province undetermined" in Panama, is actually from the Canal Zone; the Sonntag 11 cited on the same page as from "Province undetermined" in Colombia is probably from Magdalena, but may possibly be from Bolívar (as there is a

"Volador" in each of these departments). The species is described by Williams as a vine growing into the crown of trees and shrubs, with a deep-blue calyx and purplish-blue corolla, inhabiting thickets in "tierra caliente" or "tierra subtemplada", ascending to an altitude of 730 m. Maggs describes it as a "woody climber with long trailing inflorescences of a bluebell color" growing at the edges of creeks and along forest trails. Killip calls it a slender tree, 4--6 m. tall, with drooping inflorescences, the calyx-tube green, its lobes blue, the corolla-lobes purplish-blue, inhabiting the edges of woods. Haught reports it to be a high-growing liana, 20 m. tall, growing along rivers at 50 m. altitude, with harsh leaves and showy blue inflorescences. The common name "tostadito" is recorded by Pittier and by Williams from Venezuela. It has been collected in anthesis in March, May, and June, and in fruit in March. The Macbride photograph of the type collection is erroneously labeled "Brazil".

Additional citations: PANAMA: Canal Zone: Maggs II.48 (F, N). Colon: G. P. Cooper 234 (F). COLOMBIA: Antioquia: Haught 4569 (N). VENEZUELA: Aragua: Ll. Williams 10077 (F), 10160 (F). Bolívar: Ll. Williams 11475 (F, F, F, N). Carabobo: Funck & Schlim 507 [Macbride photos 34293] (F--photo of isotype, Kr--photo of isotype, Lu--isotype, N--photo of isotype); Whetzel & Miller s.n. [Herb. Estac. Exper. Agric. 746] (W). Yaracuy: Killip 37068 (W). BRAZIL: State undetermined: Glaziou s.n. (N--photo, Z--photo).

PETREA ATROCOERULEA Moldenke

Additional citations: COLOMBIA: Antioquia: Kalbreyer 1634 (N--photo of type, Z--photo of type).

PETREA BLANCHETIANA Schau.

The Sellow specimen cited below was erroneously determined as "Petraea volubilis L." by the collector.

Illustrations: Mart., Fl. Bras. 9: pl. 45. 1851; Correa, Diccion. Pl. Uteis Brasil 1: 502. 1926.

Additional citations: BRAZIL: State undetermined: Sellow 180 (Vt).

PETREA BRACTEATA Steud.

Synonymy: "Petraea macrostachya Benth." sensu Fulle, Enum. Pl. Surinam. 402. 1906 [not Petraea macrostachya Benth., 1839]. -- "Petraea volubilis Jacq." sensu Fulle, Enum. Pl. Surinam. 403. 1906 [not Petraea volubilis L., 1753]. -- "Petraea racemosa Nees & Mart." sensu Fulle, Enum. Pl. Surinam. 403. 1906 [not Petraea racemosa Nees, 1821]. -- "Petraea arborea H.B.K." sensu Fulle, Enum. Pl. Surinam. 403. 1906 [not Petraea arborea H.B.K., 1818]. -- "Petraea rugosa H.B.K." sensu Fulle, Enum. Pl. Surinam. 403. 1906 [not Petraea rugosa

H.B.K., 1818].

References: Benth., Ann. Nat. Hist. 2: 448. 1839; Rulle, Enum. Pl. Surinam. 402--403. 1906; Martyn, Ind. Phan. Jenman Herb. 464--465, mss. 1937; Moldenke, Prelim. Alph. List Invalid Names 34--35. 1940; Moldenke, Alph. List Invalid Names 34--35. 1942; Moldenke, Known Geogr. Distrib. Verbenac. 33, 38, & 97. 1942; Phytologia 2: 108. 1945.

Smith describes the species as having the "inflorescence-stalk, calyx, and corolla rich blue", growing in dense forest at edge of isolated savannas. Ducke says it has violet flowers and grows on non-inundated land. Ducke 1133 was erroneously determined by him as P. Martiana, while 872 was erroneously determined by me and cited in Castanea 10: 42 (1945) as P. rugosa.

Illustrations: Miquel, Stirp. Surinam. [Nat. Verh. Holl. Maatsch. Wet. Haarlem, ser. 2, 7:] pl. 42 [as "P. macrostachya"]. 1850; Glück, Blatt- u. Blütenmorphol. Stud. 382 [as "P. Schomburgkiana"]. 1919.

Additional citations: BRITISH GUIANA: E. H. Graham 254 (Cm); A. S. Hitchcock 17249 (N--photo, Z--photo); Jenman 3882 (U), 5935 (U); Maguire & Fanshawe 22885 (N); M. R. Schomburgk 108 [Macbride photos 17574] (Kr--photo, N--photo, Z--photo), 173 (F); A. C. Smith 2626 (F, N). SURINAM: Hostmann 39 [Macbride photos 34294] (F--photo of isotype, Kr--photo of isotype, N--photo of isotype); Hostmann & Kappler 39 [Macbride photos 22776] (Kr--photo of isotype); Kegel 1179 (Gt, Gt), 1180 (Gt); Maguire 24831 (N); Nolte s.n. (Gt); Wullschlägel 411 (Gt), 1587 (Gt). BRAZIL: Amazonas: Ducke 872 (N), 1133 (N). LOCALITY OF COLLECTION UNDESIGNATED: Herb. De Candolle s.n. [Macbride photos 7875] (Kr--photo).

PETREA BREVICALYX Ducke

Synonymy: Petraca Kuhlmannii Moldenke, Prelim. Alph. List Invalid Names 34, in syn. 1940.

References: Ducke, Archivos Jard. Bot. Rio Janeiro 6: 87 [as "Petraca brevicalyx"]. 1933; Moldenke, Prelim. Alph. List Invalid Names 34. 1940; Moldenke, Alph. List Invalid Names 34. 1942; Moldenke, Known Geogr. Distrib. Verbenac. 38 & 97. 1942.

Ducke describes the species as a low, weak, scandent shrub, with a dark-violet calyx and violet corolla. It has been collected in anthesis also in January.

Additional citations: BRAZIL: Amazonas: Ducke 140 (F, N, S), s.n. [Herb. Rio de Janeiro 22544] (N--cotype).

PETREA COLOMBIANA Moldenke

One of the specimens of Lopez R. cited below includes a photograph of the species growing in situ.

Additional citations: COLOMBIA: Santander Sur: Lopez R. s.n. [Bucaramango, 12/19/1918] (Ar, Ar). CULTIVATED: Colombia: Killip & Smith 19067 (N--photo of type, S--photo of type, Z--photo of type).

PETREA DUCKEI Moldenke

References: Moldenke, *Phytologia* 1: 469--470. 1940; Moldenke, *Known Geogr. Distrib. Verbenac.* 38 & 97. 1942.

Scandent shrub; branches slender, grayish, minutely puberulent, glabrescent in age, somewhat lenticellate; nodes not annulate; principal internodes 1.2--11.5 cm. long; leaves decussate-opposite; petioles stout, 8--12 mm. long, minutely puberulent, flattened above; blades firmly chartaceous, stiff, rather uniformly gray-green on both surfaces, somewhat shiny above, elliptic, 10.5--16 cm. long, 4.3--8 cm. wide, abruptly acute or short-acuminate at apex (the very point often obtuse), entire, acute or rounded at base, very minutely puberulent and scabrellous on both surfaces, glabrescent and merely punctate in age, the immature blades very thin-membranous and nigrescent in drying; midrib rather stout at base, rapidly diminishing in size as the apex is approached, prominent on both surfaces; secondaries very slender, 9--15 per side, prominulous above, sharply prominent beneath; vein and veinlet reticulation abundant, prominulous on both surfaces, the tertiaries sharply prominent beneath; inflorescence axillary, racemiform, 14--25 cm. long, rather loosely many-flowered; rachis slender, minutely puberulent; pedicels slender, 2--5 mm. long, elongate to 9 mm. in fruit, minutely puberulent; calyx lilac, subtended by 1--3 foliaceous prophylla, which are thin-membranous, elliptic, venose, 5--6 mm. long, 3--4 mm. wide, sharply acute or attenuate-acuminate at apex; corolla violet; fruiting-calyx indurated, its tube 6--7 mm. long, 5--7 mm. wide at apex, very minutely puberulent, its lobes greatly enlarged, broadly elliptic, to about 13 mm. long and 12 mm. wide, pinnately venose, very minutely and obscurely puberulent, abruptly acute or obtuse at apex.

The type of this species was collected by Adolfo Ducke [Herb. Jard. Bot. Rio de Janeiro 22542] -- in whose honor it is named -- on inundated shores at Paraná de Anavilhana, on the lower Rio Negro, Amazonas, Brazil, on July 24, 1939. The species is obviously very closely related to P. insignia.

Citations: BRAZIL: Amazonas: Ducke 688 (N), s.n. [Herb. Rio de Janeiro 22542] (N--type).

PETREA GLANDULOSA Pittier

References: J. A. Clark, Card Index, issue 116: January 10, 1928; Pittier, *Supl. Plant. Usual. Venez.* 55 [as "Petrea glandulosa"]. 1939; Moldenke, *Known Geogr. Distrib.*

Verbenac. 32 & 97. 1942; Moldenke, Phytologia 2: 108. 1945.

Pittier, in the reference cited above, records the common name "penitente" from Venezuela.

PETREA INSIGNIS Schau.

References: Le Cointe, A Amazonia Brasileira III, Arvores e Plantas Uteis, 169 [as "Petraea insignis"]. 1934; Moldenke, Prelim. Alph. List Invalid Names 35. 1940; Moldenke, Known Geogr. Distrib. Verbenac. 38, 73, & 97. 1942; Moldenke, Alph. List Invalid Names 35. 1942; Le Cointe, O Estado do Para 248 & 251 [as "Petraea insignis"]. 1945.

Le Cointe in the references cited above records the common names "flor de S. Miguel", "flôr de S. Miguel", "viuvinha", and "flôr de folha grande", and states that the species is cultivated in parks and gardens in Pará. Spruce records the common name "flor de Espirito Santo" on his no. 1354.

Additional citations: BRAZIL: Amazonas: Schwacke 304 [Herb. Rio de Janeiro 32217a] (Ja); Spruce s.n. [in vicinibus Barra, Dec.--Mart. 1850--51] (F, Lu). Pará: Martius s.n. [Pará; Macbride photos 20348] (Kr--photo of type).

PETREA KOHAUTIANA Presl

References: Britton, Fl. Bermuda 320. 1918; R. O. Williams, Guide Royal Bot. Gard. Trinidad 15 [as "P. volubilis"]. 1927; Freeman & Williams, Useful Pl. Trinidad 126--127 [as "P. volubilis"]. 1928; Moldenke, Prelim. Alph. List Invalid Names 34 & 35. 1940; Moldenke, Alph. List Invalid Names 35. 1942; Moldenke, Known Geogr. Distrib. Verbenac. 28, 29, 73, & 97. 1942; Phytologia 2: 108. 1945.

Britton, in the reference cited above, records the common name "tree petrea", while Freeman and Williams record "white petrea" and "bridal wreath", but it seems probable that these last two names apply more strictly to var. alba. Duss records the common name "liane rude". Hodge states that the species grows along roadsides on Dominica. It has been collected in fruit in August. The Harvey Herbarium specimen cited below bears a very interesting label reading, in a very old hand: "Anonimos scandens ramulis asperimis a limarum instar lignum rodentibus plum.-lin. G.748. didinamia angiospermia monop. Chelone lin. Digitalis virginiana etc. Fluk. Species. ou liron licti, liane a feuilles rude bone pour Amer. l'argent an ou Citiragouli, Malpighiae Species; planta a fleurs en rosette." Delrissé records the common names "liane rude" and "fleur St. Jean."

Additional citations: HISPANIOLA: Haiti: Herb. Harvey 313 (Du--166367). GUADELOUPE: Delrissé s.n. [1844] (Du--166369); Duchassaing s.n. [1852] (Du). DOMINICA: Hodge 870 (N), 3651 (N). MARTINIQUE: Duss 1979 (F); Kohaut s.n. [Sieber, Fl. Mart. 157, in part] (N--photo of isotype, Z--photo of iso-

type), s.n. [Sieber, Fl. Mixta 374] (Lu). GRENADA: W. E. Broadway s.n. [Presbytery, June 6, 1906] (F). CULTIVATED: St. Croix: L. A. Ricksecker 329 (F).

PETREA KOHAUTIANA var. ALBA (Freeman & Williams) Moldenke

Synonymy: Petrea volubilis var. alba Freeman & Williams, Useful Pl. Trinidad 127. 1928. -- Petrea Kohautiana var. anomala Moldenke in Fedde, Repert. 43: 31. 1938. -- Petraea alba Hort. ex Moldenke in Fedde, Repert. 43: 31, in syn. 1938.

References: R. O. Williams, Guide Royal Bot. Gard. Trinidad 15. 1927; Freeman & Williams, Useful Pl. Trinidad 126--127. 1928; Moldenke, Geogr. Distrib. Verbenac. 39. 1939; Moldenke, Alph. List Common & Vern. Names 6. 1939; Lilloa 4: 309. 1939; Moldenke, Prelim. Alph. List Invalid Names 34 & 35. 1940; Moldenke, Alph. List Invalid Names 34 & 35. 1942; Moldenke, Known Geogr. Distrib. Verbenac. 73 & 97. 1942; Phytologia 2: 108. 1945.

Freeman and Williams record the common names "white petrea" and "bridal wreath". Broadway, as long ago as 1908, described the plant on his collection labels as "Petraea volubilis (white variety)", and stated that it has "branches pendent, sometimes climbing."

Additional citations: CULTIVATED: Trinidad: W. E. Broadway 3197 (S--photo), s.n. [St. Ann's, 1908] (La).

PETREA LONGIFOLIA Moldenke

Synonymy: Petraea longifolia Moldenke, Suppl. List Invalid Names 6, in syn. 1941.

References: Moldenke, Alph. List Invalid Names 34. 1942; Moldenke, Known Geogr. Distrib. Verbenac. 75 & 97. 1942.

This species is very close to P. maynensis Huber and may prove to be conspecific with it.

Additional citations: LOCALITY OF COLLECTION UNDESIGNATED: Herb. Mus. Paris s.n. (F--fragment of isotype).

PETREA MACROSTACHYA Benth.

Synonymy: Petraea guianensis Cham. ex Moldenke, Prelim. Alph. List Invalid Names 34, in syn. 1940.

References: Martyn, Ind. Phan. Jenman Herb. 465, mss. 1937; Moldenke, Prelim. Alph. List Invalid Names 34. 1940; Moldenke, Known Geogr. Distrib. Verbenac. 33, 38, & 97. 1942; Moldenke, Alph. List Invalid Names 34 & 35. 1942; Phytologia 2: 108. 1945.

Ducke describes the flowers as violet, while Smith reports the calyx "rich blue; corolla rich violet" or "calyx pale blue, marked with green" and states that the species grows in dense forests at altitudes of from 150 to 400 m. It has been collected in anthesis in January, March, and April,

and in fruit in March, April, and September. The Macbride photograph no. 34292, cited below, is erroneously labeled "Funck & Schlim 150". The Hostmann s.n. distributed as this species, from Surinam, is actually Triplaris surinamensis Cham. in the Polygonaceae, as is also the Schweinitz s.n. from the same country. The illustration in Miquel, Stirp. Surinam. [Nat. Verh. Holl. Maatsch. Wet. Haarlem, ser. 2, 7:] pl. 42 (1850) is not P. macrostachya, but is P. bracteata Steud.

Additional citations: BRITISH GUIANA: M. R. Schomburgk 158 [Macbride photos 34292] (F--photo of isotype, Kr--photo of isotype); A. C. Smith 2148 (N), 3401 (F, N). BRAZIL: Pará: Ducke s.n. [Herb. Rio de Janeiro 14294] (N).

PETREA MARTIANA Schau.

References: Le Cointe, A Amazonia Brasileira III, Arvores e Plantas Uteis, 470 [as "Petraea martiana"]. 1934; Moldenke, Prelim. Alph. List Invalid Names 34 & 35. 1940; Moldenke, Known Geogr. Distrib. Verbenac. 35, 38, & 97. 1942; Moldenke, Alph. List Invalid Names 34 & 35. 1942; Le Cointe, O Estado do Para 251 [as "Petraea martiana"]. 1945.

The species has been collected in anthesis in June and October, and in fruit in February and October. Ducke describes the flowers as violet and states that the species grows along the margins of woods. Le Cointe says it is cultivated in parks and gardens in Pará, and records the common name "viuvinha".

Additional citations: PERU: Loreto: W. Fox 96 (F). BRAZIL: Pará: Ducke s.n. [Herb. Rio de Janeiro 14291] (N); Sampaio 5092 [Herb. Rio de Janeiro 19128, in part] (N).

PETREA MAYNENSIS Huber

References: Moldenke, Prelim. Alph. List Invalid Names 35. 1940; Moldenke, Alph. List Invalid Names 35. 1942; Moldenke, Known Geogr. Distrib. Verbenac. 31, 35, 38, 40, 73, & 97. 1942.

Ducke reports the calyx as almost white and the corolla violet, while Kuhlmann describes the calyx as blue and the corolla violet, but white at the center. It has been collected in anthesis also in January and February. It is possible that P. longifolia may be conspecific with this species.

Additional citations: COLOMBIA: Putumayo: Klug 1894 (S). PERU: Loreto: Huber 1489 (N--photo of fragment, N--photo of type, Z--photo of fragment, Z--photo of type). BRAZIL: Amazonas: Ducke s.n. [Herb. Rio de Janeiro 35657] (N). Pará: Huber 3676 (N--photo, Z--photo). BOLIVIA: El Beni: J. G. Kuhlmann s.n. [Herb. Rio de Janeiro 22541] (N). La Paz: Kru-koff 10729 (N), 10735 (N). Santa Cruz: Steinbach 3470 [Herb. Inst. Miguel Lillo 38010] (N, N). CULTIVATED: Brazil: Ducke

s.n. [Para; Herb. Rio de Janeiro 22543] (N).

PETREA NITIDULA Moldenke

Additional citations: BRAZIL: Amazonas: Spruce 2536 (Lu), 2926 [Macbride photos 34290] (F--isotype, F--photo of isotype, Kr--photo of isotype, N--photo of isotype).

PETREA PERUVIANA Moldenke

Williams reports the vernacular name "sanango sachá" for this species and records its blooming and fruiting in May and June.

Additional citations: PERU: Loreto: Klug 170 (F), 637 (F--isotype); Ll. Williams 690 (F), 8106 (F).

PETREA PERUVIANA var. **ACUMINATA** Moldenke

Williams describes this plant as a "forest creeper", while Miss Mexia says it is a "vine climbing medium trees, altitude 110 m., frequent in cut-over woods, flowers purple, February."

Additional citations: PERU: Loreto: Mexia 6498 (F, I); Ll. Williams 647 (F).

PETREA PUBESCENS Turcz.

References: Pittier, Supl. Plant. Usual. Venez. 55 [as "Petrea pubescens"]. 1939; Moldenke, Alph. List Common & Vernac. Names 25. 1939; Moldenke, Known Geogr. Distrib. Verbenac. 31, 32, 34, 38, 73, & 97. 1942; Phytologia 2: 108. 1945.

Pérez Arbeláez and Cuatrecasas describe the flowers of this species as lilac. It has been collected in fruit in January, April, and August. The leaves on the García Barriga specimen cited below are anomalous in being very thin-textured. Ule 9722 is labeled "Seringal Auristella, Peru", but seems actually to have been collected in Acre Territory, Brazil. The Macbride photograph 34291, cited below, is erroneously labeled "Brazil".

Additional citations: COLOMBIA: Cundinamarca: Pérez Arbeláez & Cuatrecasas 6577 (N, W). Magdalena: H. H. Smith 1521 (Ca, Cm, Vt). Meta: García Barriga s.n. [Herb. Nac. Colomb. 5206] (W). Santander Norte: Cuatrecasas & García Barriga 10173 (W). VENEZUELA: Mérida: Funck & Schlim 1504 [Macbride photos 34291] (F--photo of isotype, Kr--photo of isotype, Lu--isotype, N--photo of isotype). BRAZIL: Acre Territory: Ule 9722 (N).

PETREA PUBESCENS var. **KLUGII** Moldenke

Additional citations: PERU: San Martín: Klug 4155 (E--isotype, I--isotype, S--isotype).

PETREA RACEMOSA Nees

References: Mart., Fl. Bras. 9: pl. 45 [as "P. subserrata"]. 1851; Bocq., Rev. Verbenac. pl. 20. 1861--1863; Baillon, Hist. Pl. 11: 80, figs. 78--81. 1891; Briq. in Engl. & Prantl, Nat. Pflanzenfam. 4 (3a): 157. 1895; Crevost & Pételot, Bull. Econ. Indo-chine 37: 1288 [as "P. subserrata"]. 1934; Moldenke, Annot. List 108. 1939; Hoehne, Kuhlmann, & Handro, O Jard. Bot. São Paulo 578 [as "Petraea subserrata"] 1941; Moldenke, Prelim. Alph. List Invalid Names 34 & 35. 1940; Moldenke, Alph. List Common & Vernac. Names 12, 25, 31, & 33. 1939; Moldenke, Known Geogr. Distrib. Verbenac. 38, 41, 74, & 97. 1942. 1942; Moldenke, Alph. List Invalid Names 34 & 35. 1942; Kuhlmann, Instit. de Botan. Observ. Ger. Contrib. 5: 20 & VI [as "Petraea racemosa"]. 1942; Sampaio & Peckolt, Arquiv. Mus. Nac. Rio de Janeiro 37: 375 [as "P. volubilis Vell." and "P. subserrata"]. 1943; Stellfeld, Tribuna Farmaceutica [Vellozoa] 12: 55, 62, & 102 [as "P. volubilis Vell.", "P. subserrata", and "P. sub-serrata Cham."]. 1944; Phytologia 2: 108. 1945.

Hoehne, Kuhlmann, and Handro, in the reference cited above, record the common names "flor de S. Miguel" and "viuvinha", Kuhlmann records "flor de São Miguel" and "flor de viuva", and Stellfeld lists "coroa de viuva", "grinalda de viuva", "touca de viuva", and "flor de São Miguel".

"Purple wreath" is recorded on the Ames Herbarium specimen.

Additional illustrations: Mart., Fl. Bras. 9: pl. 45 [as "P. subserrata"]. 1851; Bocq., Rev. Verbenac. pl. 20. 1861--1863; Briq. in Engl. & Prantl, Nat. Pflanzenfam. 4 (3a): 157. 1895; Crevost & Pételot, Bull. Econ. Indo-chine 37: 1288 [as "P. subserrata"]. 1934.

Additional citations: BRAZIL: Bahia: Wied-Neuwied s.n. [Belmonte] (E--photo of type). Minas Geraes: G. Gardner 5127 (F); Heringer 63 [Herb. Inst. Biol. S. Paulo 39039] (Sp), s.n. [Herb. Est. Exp. de Café; Herb. Dept. Bot. Est. S. Paulo 44607] (N); Mello Barreto 3267 [Herb. Jard. Bot. Bello Horizonte 931] (F), 3268 [Herb. Jard. Bot. Bello Horizonte 11244] (F); Mosén 645 (Lu); Widgren s.n. [1845; Herb. Monac. 1645; Herb. Rio de Janeiro 31718] (Lu, Lu, N). Paraná: Dusén 15874 (Lu), s.n. [Jaguariahyva, 27.II.1914] (La, Mi). Rio de Janeiro: Hagendorf s.n. [cotype coll. of Petraea subserrata Cham.] (S--photo); Herb. Rio de Janeiro 31719 (N); Martius s.n. [1823; Macbride photos 7874] (Kr--photo). Santa Catharina: Herb. Rio de Janeiro 31775 (N). São Paulo: Amaral 3 [Herb. Inst. Biol. S. Paulo 34704] (Sp); Santoro s.n. [Herb. Inst. Agron. Est. S. Paulo 678] (Ba); Swentorzeoxy 6 [Herb. Dept. Bot. Est. S. Paulo 41835] (N); Zagatto s.n. [Herb. Inst. Agron. Est. S. Paulo 3096; Herb. Dept. Bot. Est. S. Paulo 44303] (Sp). State undetermined: P. Clausen s.n. [1840] (Du--166368); Sellow s.n. [Macbride photos 17575; co-

type coll. of Petraea subserrata Cham.] (Kr--photo, S--photo, Vt); Wied-Neuwied s.n. [Brasilia] (Lu). CULTIVATED: Brazil: Piere s.n. [Rio de Janeiro; Herb. Rio de Janeiro 31520] (N). Missouri: Herb. Ames s.n. [St. Louis] (Oa). New York: P. J. Connolly s.n. [New York Bot. Gard. Cult. Plants 27675] (N); Hartling s.n. [New York Bot. Gard. Cult. Plants 8885] (Ur), s.n. [New York Bot. Gard. Cult. Plants 11813] (Ur); H. N. Moldenke 4644 (N), 10409 (N).

PETREA RUGOSA H.B.K.

The species is reported by Haught as growing fully exposed to the sun on dry sand ridges, with very showy inflorescences of bright-blue flowers. Popenoe describes it as "a rare and handsome ornamental slender shrub", blooming in November. Ducke describes it as a woody vine, with violet flowers, growing in non-inundated woods. Dryander reports the flowers as "lilac" in color and reports the common name "chaparilla". Daniel gives the common name "pluma de reina" and states that the inflorescences are blue. The species has been misidentified as P. arborea by some workers.

Additional citations: COLOMBIA: Antioquia: Daniel 2665 (W--1857567). Caldas: Haught 2103 (N). El Valle: Dryander 2303 (W). Tolima: Hartweg 1359 (Lu). VENEZUELA: Federal District: Bonpland s.n. [Macbride photos 39477] (F--photo of type, Kr--photo of type). BRAZIL: Amazonas: Ducke 872 (W). CULTIVATED: Honduras: Yuncker 4705 (Dp). Colombia: Popenoe 1203 (Ar).

PETREA SCABERRIMA Moldenke

Additional citations: COLOMBIA: Cundinamarca: Purdie s.n. [Santa Fé de Bogotá] (N--photo of type, Z--photo of type).

PETREA VOLUBILIS L.

Synonymy: Petraea arborea (Kunth) Smith & Wiles in Forbes, Wand. Nat. East. Arch. 2: 78--79 & 514. 1885; H. J. Lam, Verbenac. Mal. Arch., addenda. 1919. -- Petrea mexicana Schiede ex Moldenke, Prelim. Alph. List Invalid Names 35, in syn. 1940. -- Petraea volubilis Merr., Plant Life Pacif. 161 & 274, sphalm. 1945. -- Petrea uolubilis Sessé & Moc., in herb.

References: Jacq., Select. Stirp. Amer. Hist. pl. 114. 1763; Jacq., Select. Stirp. Amer. Hist. Picta, pl. 173. 1780; Lodd., Bot. Cab. 8: pl. 736. 1823; Vell., Fl. Flum. 6: pl. 59. 1827; Géel, Sert. Bot. 3: cl. 14. 1832; Knowles & Westc., Floral Cab. 3: pl. 108. 1840; Journ. Hort., ser. 3, 7: 53. 1883; Forbes, Wand. Nat. East. Arch. 2: 78--79 & 514. 1885; Baillon, Hist. Fl. 11: 80, figs. 78--81. 1891; Bois, Dict. Hort. 944. 1893--1899; G. W. Oliver & W. Miller in L. H. Bailey, Cycl. Amer. Hort. 4: 1284. 1901; Millsp. & Loes. in

Engl., Bot. Jahrb. 36: Beibl. 80: 26. 1905; Gard. Chron., ser. 3, 39: 24 & 25, fig. 15. 1906; Journ. Hort., ser. 3, 54: 390. 1907; Gard. Chron., ser. 3, 51: 287. 1912; L. H. Bailey, Stand. Cycl. Hort. 5: 2562. 1916; Rehnelt, Gartenwelt 28: 367, figs. 1924; Jordahn, Gard. Chron. Amer. 30: 171. 1926; Nessel, Gartenfl. 75: 321--322, fig. 1926; Junell, Symb. Bot. Upsal. 4: 43 & 45 [as "Petraea volubilis Jacq."]. 1934; Catologo Quinta Perez Estr. San Pedro Sula 30. 1935; Phelps, Bull. Garden Club Amer., ser. 6, 2: 11. 1937; Moldenke in Fedde, Repert. 43: 1--48 & 161--221. 1938; Svensk. Bot. Tidsk. 32: 231. 1938; Standl., Field Mus. Publ. Bot. 18: 1012. 1938; Moldenke, Alph. List Common & Vernac. Names 1, 4, 6, 7, 8, 9, 12, 15, 17, 19, 23, 25, 26, 27, 28, 30, & 31. 1939; Moldenke, Suppl. List Common & Vernac. Names 24. 1940; Moldenke, Prelim. Alph. List Invalid Names 34 & 35. 1940; Calderón & Standl., Fl. Salvador., ed. 2, 238 [as "P. arborea"]. 1941; Instit. de Botan. Observ. Ger. Contrib. 2: 65 & 5: VI [as "Petraea volubilis L."]. 1942; Moldenke, Alph. List Invalid Names 34--36. 1942; Moldenke, Known Geogr. Distrib. Verbenac. 17, 20--27, 29, 62, 64, 65, 74, & 97. 1942; H. F. Macmillan, Trop. Planting & Gard., ed. 5, 122. 1943; E. D. Merr., Plant Life Pacif. 161 & 274. 1945; Moldenke, Phytologia 2: 108. 1945; Le Cointe, O Estado do Para 251 [as "Petraea volubilis Jacq."]. 1945; New York World Telegram for April 5, 1946, p. 17. 1946.

The common name "queen's-wreath" is recorded for this species by A. C. Jordahn in the reference cited above, who describes the plant as "one of Florida's lovely vines." The name "bejuca de caballo" recorded by Phelps in the reference cited above for P. arborea actually applies to P. volubilis instead. The names "choreque" and "purple wreath" are recorded by Standley (above), who reports the species as frequent in thickets and dry forests of the Pacific "tierra caliente" of Costa Rica. Gerth van Wijk lists "purple wreath", "liane rude", and "liane de St.-Jean". The Mayan name "yoxop-jimin" is recorded in Phytologia 2: 108. Grey and Hubbard in List Plants Bot. Gard. Atkins Inst. 157 (1933) record the name "queen's wreath" from Cuba. The vernacular designation "chaparro" is listed in Catologo de la Quinta Perez Estrada San Pedro Sula (above) from Honduras. According to the Lundells the species is called "piocha viejo" in Yucatán, where it is a common woody vine to 2 m. tall in the advanced deciduous forest and among second growth. Steggerda records the Mayan name "yoch opp tzimin", while Millspaugh and Loesener in the reference cited above record "opp-tzimir" and "purple-wreath". From Cuba comes the name "flor de papel", recorded by Leon. Le Cointe says (above) that in Pará it is cultivated in parks and gardens and called "viuvinha".